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PATENT AND TECHNICAL TRANSLATION

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May 13, 2006

DECLARATION

The undersigned, Olaf Bexhoeft, hereby states that he is well acquainted with both the English and German languages and that the attached is a true translation to the best of his knowledge and ability of the German text of PCT/DE2003/03972, filed 12/03/2003, and published on 07/08/2004 as WO 2004/056686 A1.

The undersigned further declares that the above statement is true; and further, that this statement was made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any patent resulting therefrom.

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Specification

Devices for Treating and/or Conveying a Strip of Material and Method for Regulating Said Devices

The invention relates to devices for processing and/or conveying a web, as well as to methods for their regulation in accordance with claims 1, 3, 12 or 14, or 42, 43 or 44.

A device for longitudinal cutting of foils and tapes is known from EP 1 238 935 A2, wherein an upper cutter can be positioned transversely to the transport direction of the web for setting a cutting width.

A roll changer is known from DE 101 50 810 A1, wherein two roll arms form a pair for receiving a roll, each of which can be individually moved by its own motor along an axis of rotation of the roll.

DE 196 02 248 A1 discloses a former which, for the lateral control of the folded continuous web, can be moved along an inlet gap between two downstream located rollers.

A turning bar, which can be positioned transversely to the incoming direction of the web, and a register roller, which can be positioned along the incoming direction of the web, are known from WO 01/70608. The turning bar is pivotable in such a way that it provides directional changes toward the right or the left, depending on its position.

DE 36 14 981 C2 discloses two web edge sensors, each of which has a drive mechanism and is controlled by a common control device. DE 35 33 274 C3 discloses a similar device.

A transport direction with two side-by-side arranged conveying devices for endless material is shown in DE 195 40

164 C1, wherein each device has an axially movable advancement arrangement.

An arrangement by means of which it is possible to cut two partial webs or three partial webs of variable width out of a running paper web of maximum width and to fold these partial webs is known from DE 42 04 254 A1. The arrangement shown there includes three formers arranged at two levels, wherein two formers which adjoin each other at a first level are arranged to be displaceable transversely to the running direction of the paper web in order to be selectively used for folding both partial webs of a paper web divided into two, or for folding the two outer partial webs of a paper web divided into three. A matching of other web-conducting devices except for the formers to the respective web width is not provided.

A turning bar arrangement is known from DE 43 11 437 A1, whose turning bars can be shifted for displacing a web which has been turned by them over its width toward the left or the right, depending on the position of the turning bars. This turning bar arrangement cannot be easily combined with the arrangement of DE 42 04 254 A1, since a partial web divided into three and which is displaced by half a web width, does not meet the former for which it is destined.

The object of the invention is based on providing devices for processing and/or conveying a web, as well as methods for their regulation.

In accordance with the invention, this object is attained by the characteristics of claims 1, 3, 12 or 14, or 42, 43 or 44.

A substantial advantage to be obtained by means of the device or the method rests on the one hand in that an extensive setting at the time of the start of the production is omitted. In contrast to settings taking place at the start of printing by means of control circuits, the amount of waste can be reduced.

A particular advantage of the invention is that it makes possible a rapid adaptation to a change of the web widths to be processed, since a user does not have to gain individual access to every web processing tool which must be displaced for adaptation to the web width.

Further time savings result if the control unit itself is designed to automatically calculate and set the positions of the various processing tools which are required to be correlated with each other from a small number of input parameters. In the simplest case it suffices for calculating these positions to merely preset the width of a web to be processed; from this preset information the control unit can determine the required position of all processing tools in a simple way with the provision, that regardless of their widths, a reference line of all webs to be processed, for example a right or left edge, or preferably the center line, takes up the same position.

Since the displacements of some web processing tools required for adaptation to a changed web width are fixedly correlated, the device can be simplified in that one actuating member is used for simultaneously displacing several web processing tools.

For example, a former is a part of the web processing tools of the device in accordance with the invention. With a

suitable selection of the reference line it may be sufficient if only one of two formers can be displaced; however, if the center line of the web to be processed is selected as the reference line, which is preferable, at least both side-by-side arranged formers must be displaceable.

In order to generate several partial webs from a single initial web in the device in accordance with the invention, each of which then can be fed to individual formers, the device in accordance with the invention usefully has at least one cutter for longitudinally cutting the initial web into partial webs. If more than one such cutter exists, at least one of them must be displaceable.

Furthermore, a device can have at least one interval cutter for the longitudinal cutting of the web of material into pages. If the web of material is a printed paper web, in particular a newspaper, such an interval cutter can be employed for respectively cutting the web locally at the height of every second page, in order to produce, for example, a broadsheet signature with a tabloid insert.

It is also of advantage if the device has a longitudinal cutting arrangement with at least one cutter, which is also preset transversely to the running direction of the web in order to fix the cutting line for the partial webs to be created.

If an initial web cut into several partial webs is being processed in the device, traction or interceptor rollers as web processing tools are usefully assigned to each partial web in the same way. It is therefore desirable that such rollers are also automatically positionable by the

control unit in accordance with the width of the initial web to be processed and the number of partial webs.

Turning bars can also be provided as processing tools which can be displaced by means of the control unit. Also, here and in what follows, web conducting devices, web drive mechanisms and/or web guidance devices such as, for example, turning bars, contact pressure rollers and/or guide rollers, are understood to be processing tools.

For driving the displacement movement of the processing tools, the actuating members preferably each have a threaded spindle, and the displaceable processing tools each have a sliding block which is in engagement with such a threaded spindle.

Such a threaded spindle can advantageously have several sections which differ in their direction of rotation and/or gradient, and the sliding blocks of several processing tools of the same type are each in engagement with the different sections of an identical spindle in order to displace the processing tools in a coupled manner, but in different directions and/or at different speeds, as required.

Exemplary embodiments of the invention are represented in the drawings and will be described in greater detail in what follows.

Shown are in:

Fig. 1a, displaceable formers, set for a broad paper web,

Fig. 1b, displaceable formers, set for a narrow paper web,

Fig. 2a, an interceptor roller with displaceable rollers, set for a broad paper web,

Fig. 2b, an interceptor roller with displaceable rollers, set for a narrow paper web,

Fig. 3a, a longitudinal cutting device with displaceable cutters, set for a broad paper web,

Fig. 3b, a longitudinal cutting device with displaceable cutters, set for a narrow paper web,

Fig. 4a, displaceable crossed turning bars, set for a broad paper web,

Fig. 4b, displaceable crossed turning bars, set for a narrow paper web,

Fig. 5a, displaceable parallel turning bars, set for a broad paper web,

Fig. 5b, displaceable parallel turning bars, set for a narrow paper web,

Fig. 6, displaceable crossed turning bars with a common drive mechanism,

Fig. 7, displaceable parallel turning bars with a common drive mechanism,

Fig. 8, a former, movable in the web running direction,

Fig. 9, a schematic representation of a printing press.

A former arrangement is represented in Fig. 1a, wherein two partial paper webs 01, 02 are conducted side-by-side over a roller 03 and thereafter into two formers 06, 07. The formers 06, 07 are displaceably seated in a frame 04 parallel with the shaft of the roller 03. An actuating member for displacing the formers 06, 07 is constituted by a threaded

spindle 08, which extends parallel with the shaft of the roller 03 and has two sections with opposite identical gradients and a drive mechanism 11, for example, an electric motor 11, for the rotary driving of the threaded spindle 08. The drive mechanism 11 and the gear moving the former 06, 07 can also be designed in another way. Each of the formers 06, 07 is provided with the sliding block 09, wherein the two sliding blocks 09 are in engagement with different sections of the threaded spindle 08, so that a rotation of the threaded spindle 08 drives the formers 06, 07 to make oppositely directed movements. An electronic control unit 10, or a system S for presetting mentioned in what follows, controls the electric motor 11 in accordance with a width of the paper webs 01, 02 entered by the user in the control unit 10 (or stored in the System S). The information regarding the width can also be implemented in the control device 10 (or the system S) in other ways, for example by reading in a common value or a value which is pre-stored in a production planning system, a printing press control, an imposition pattern and/or a control console (equivalently identified in Fig. 9 with P).

A frame 15 or stand 15 connected with the left former 06 is simultaneously used as a support for a bearing of the roller 03, so that the roller 03 follows each movement of the former 06. The right side of the roller 03 is telescopically displaceable on a journal fixed on the frame 04, for example, by means of an axially displaceable bearing 25, (Fig. 1b). In the course of the displacement of the former 06, the roller 03 therefore is also displaced, as well as a groove 20 (in dashed lines in Fig. 1b) encircling the roller 03, which

works together with a cutter as a cutting groove for continuous or intermittent longitudinal cutting.

An interval cutter 05, or skip slitter 05, is also rigidly connected with the former 06, for example via the stand 15, and is mounted above the roller 03. The interval cutter 05 has a rotating intermittent cutting edge, which is aligned with the fold line of the former 06 and which cuts, respectively alternatingly, one pair of a pair of printed pages alternatingly imprinted on the partial paper web 01, and leaves the other one uncut. If the uncut pairs of sides are sides of broadsheets with lines oriented transversely in respect to the conveying direction, and the cut pairs are tabloid pages, whose lines are oriented in the conveying direction, it is possible in a simple manner to produce a signature with an insert of half a page size from the partial paper web 01 in a connected folding apparatus, not represented.

The setting of the formers 06, 07 for processing two partial paper webs 12, 13, which in respect to the partial paper webs 01, 02 of Fig. 1a are narrower by the value d, is represented in Fig. 1b. The center line M where the webs 12, 13 touch each other, has the same position in relation to the stand as the center line M between the webs 01, 02 in Fig. 1a. For setting the formers 06, 07 for processing such narrow partial paper webs 12, 13, the threaded spindle 08 is rotated by means of the electric motor 11, so that the formers 06, 07 are respectively displaced by d/2 in the direction toward the center line M.

In an advantageous variation, or further development, a driven roller 30, which is arranged downstream of the former

tip with the former 06, 07 additionally to, or in place of the cutter 05, is laterally movable together with, or at the same time as, the former 06, 07. To this end, the former 06, 07 is preferably connected with a seating of the roller 30, preferably by means of a common stand 15. In the course of displacing the former 06, 07, the roller 30 is simultaneously moved. The roller 30 is either embodied as a driven transfer roller 30, over which a continuous web, which is leaving the former 06, 07, is conducted and undergoes a directional change. In another embodiment, the roller 30 can be designed as a traction roller 30 of a traction roller group and is, for example, individually motor-driven, against which a contact pressure roller 35 can be placed. In this case the entire traction group 30, 35 is connected with the former 06, 07.

Of course a former arrangement of the type represented in Figs. 1a, 1b could also have three or more formers for processing a corresponding number of partial webs. If three parallel partial webs are to be processed, and their center line M, regardless of the width of the webs, always has the same position in respect to the stand, the two outer formers must be respectively displaced by d in case of a change of the partial webs by d, while the center former remains without being displaced. With four partial webs, the displacement correspondingly is d/2 for the two center ones, and 3d/2 for the two outer ones, etc.

In an advantageous embodiment it has been provided for the pre-setting the printing press (see Fig. 9) that the control device 10, or the drive mechanism 11 for the described movement of the former 06, 17, is in a signal

connection with the system S. Based on the production data (for example the web width or partial web width b, b'), the actual position of the former 06, 07 is compared with a position which has been or can be preset for this production and, if required, a corresponding movement is initiated via actuating commands to the respective drive mechanism 11. Depending on the width of the web or partial web and/or the position of its center, the former 06, 07 (or the former tip) should be correspondingly laterally positioned. For example, the former 06, 07 is positioned in such a way that the partial web 02, 05 runs up to the respective former 06, 07 centered in respect to the former tip. It is possible for presetting values to be stored in the form of tables for the various production runs, or a calculation takes place in the system on the basis of the web paths resulting from the web widths and the lateral offset.

Fig. 2a shows an interceptor roller arrangement as a further example of web processing tools in a device in accordance with the invention. This interceptor roller arrangement consists of a roller 14, around which a paper web, not represented in the drawing, which is to be intercepted, is wrapped during production, several rollers 16, several sliding blocks 18, 19, 21, a guide rail 17, a threaded spindle 22 and an electric motor 23, which is controlled by the already mentioned control unit 10 (or the system S).

The roller 14 is rotatably seated in the frame 04. The guide rail 17 is seated in the frame 04 parallel with the roller 14. Several sliding blocks 18, 19 are displaceably arranged on the guide rail 17. A sliding block 21, which is

arranged centered in respect to the roller 14, is fixedly arranged on the guide rail 17. Each of the sliding blocks 18, 19 and 21 supports a rotatably seated roller 16. In this case the rollers 16 press against the roller 14 and roll off on it. Since the rollers 16 are laid out to be rotatable in only one direction, they prevent a return movement of the paper web wrapped around the roller 14 in case of a possible paper web break.

The threaded spindle 22 passes through the frame 04 on one side and projects from the frame 04 at this point. In this case it is aligned parallel in respect to the roller 14 and the guide rail 17. The threaded spindle 22 has two different threaded sections which turn in different directions and are separated from each other by a section without a thread. The sliding block 21 is arranged on this threadless section. The two threaded sections have gradients which increase along a longitudinal axis of the threaded spindle 22 proportionally to the distance from the sliding block 21. The sliding blocks 18, 19 are not in engagement with the left or right threaded section, viewed from the sliding block 21, by means of an interior thread with several turns - such a one would become stuck because of the variability of the gradient, but by a single narrow pin which engages the thread of the threaded spindle 22 on a small circumferential section of the latter. The electric motor 23 engages the threaded spindle 22 at the end section of the threaded spindle 22 projecting from the frame 04.

If the represented interceptor roller is intended to be used in connection with a paper roll of lesser width, the sliding blocks 18, 19 are displaced along the guide roller 17

as represented in Fig. 2b. In the process, the threaded spindle 22 is rotated by means of the drive mechanism 23. Because of the different direction of rotation of the two threaded sections which are in engagement with the sliding blocks 18 or 19, in the course of a rotation of the threaded spindle 22 the sliding block 18 moves from the left and the sliding block 19 from the right in the direction toward the center sliding block 21. In this case the movement of the sliding blocks 18, 19 takes place synchronously, but as a result of the gradients of the threaded sections, which change along the longitudinal axis of the threaded spindle 22, the paths traveled by the sliding blocks 18, 19, and therefore the rollers 16 conducted by them, differ proportionally in respect to their distance from the center sliding block 21. Depending on the width of the paper web to be processed, the sliding blocks 18, 19 can be continuously displaced more or less close to the sliding block 21 by an appropriate turning of the threaded spindle 22, and in this way the interceptor roller can be set for any arbitrary paper web width. Prior to their displacement, the sliding blocks 18, 19 can be placed in any arbitrary position at the spindle 22, the ratio of their distances is maintained during a displacement.

It is also conceivable to provide two threaded sections, each with a gradient which remains the same over their length. This is sufficient for a roller arrangement with no more than three different rollers 16. In the case of a larger number of rollers, as represented in Fig. 2b, the distance between the two left sliding blocks 18 (and also between the right sliding blocks 19) would remain constant if

they are displaced, and the distance relationships would change in case of a displacement.

Another option would be to provide each individual one of the four sliding blocks 18, 19 with its own threaded section with a specific gradient. However, in that case the variability of the web widths to which the interceptor roller can be set is restricted in that the sliding blocks - at least those which are coupled to the spindle by means of an interior thread with several turns - could not leave the threaded sections having the gradient suitable to their thread.

It is also possible to provide several threaded spindles, each with two sections of opposite identical gradients, each of which supports sliding blocks of rollers which are located opposite each other in a mirror-reversed manner in relation to the center line M. For practical purposes, these threaded spindles are identical to each other. For achieving different displacements of the rollers coupled with them, the threaded spindles can be driven by a common electric motor via a gear with a respectively matched transmission ratio, or each threaded spindle has its own electric motor, which is respectively individually triggered by the control unit according to the required displacement.

In the just described manner it is also possible to design traction roller arrangements in a manner which can be set for paper webs of different widths to be processed, because traction roller arrangements in principle have a structure analog to that of interceptor roller arrangements. Such presetting values can be stored in tables for the

different production runs, or a calculation takes place in the system S on the basis of the use from the web widths and the lateral offset to be obtained.

Fig. 3a shows a longitudinal cutting arrangement 71 of a superstructure 67 (Fig. 9). The longitudinal cutting arrangement 71 is designed for longitudinally cutting an incoming web into several partial webs, for example two partial webs. In this case two guide rails 24 are arranged parallel in the frame 04. A paper web 26 is conducted between the two guide rails 24. Two carriages 27 are displaceably maintained on the two guide rails 24. They are designed and mounted mirror-reversed in respect to each other. Each carriage 27 supports a rotating cutter 28 with cutting edges oriented perpendicularly in respect to the paper web 26, and a counter-pressure roller 29 (counter-cutter) working together with the cutter 28. A further cutter 32 is located between the carriages 27, which also extends perpendicularly in respect to the paper web 26, and a counter-pressure roller 31 working together with the cutter. The paper web 26 is cut into four partial webs by the cutters 28, 32 and the counter-pressure rollers 29, 31. A threaded spindle 33, which is parallel with the guide rails 24, has two spindle sections of different directions of rotation and the same gradient, each of which is in engagement with one of the carriages 27. An end section of the threaded spindle 33 projects out of the frame 04 on one side. A drive mechanism 34, for example an electric motor 34, for the rotary driving of the threaded spindle 33 is provided in this end section. The individual cutters 28, 29, or counter-cutters, can also be drivable together by a means of a different type of drive

mechanism 34, or by individual drivers per cutter or pairs of cutters.

If the described longitudinal cutting arrangement is intended to cut a paper web 36 of narrow width into four partial webs, the threaded spindle 33 is rotated by the electric motor 34, as shown in Fig. 3b. Since the carriages 27 are in engagement with different threaded sections of the threaded spindle 33, which have different directions of rotation and the same gradient, the rotation of the threaded spindle 33 causes each of the carriages 27 to move over the same distance in a direction toward each other, or toward the center cutter 32. The turning of the threaded spindle is continued until the distance between two cutters 28, 32 corresponds to a quarter of the width of the narrow paper web 36.

The operation of the motor 34 is controlled, or preset, by the control unit 10 (or the system S), which calculates the position of the cutters 28 by means of a width of the web to be cut, set by the user, or is automatically detected by sensors (not represented), or of the partial webs resulting from the cutting.

In the case of several cutter units (pairs of cutters 28, 32 and counter-cutter 29) it is for example possible to drive them all separately, and/or to bring them into and out of contact individually.

The axial positioning or at least pre-setting of the printing press control is preferably automatically performed on the basis of the width of the web intended for being imprinted and of the cutting lines to be made specifically in respect to the product, or manually from an operating

console. To this end a check is made, for example prior to production start, by the system S (from the printing press control or an appropriate software program), regarding the actual setting in respect to pre-setting values required for the planned production, and/or a pre-setting by acting on the drive mechanism 34 (or the drive mechanisms 34) is performed. Such presetting values can be stored in tables for the different production runs, or a calculation takes place in the system S on the basis of the use from the web widths and the lateral offset to be obtained.

A turning-bar deck with two crossed turning bars 37, 38 is represented in Fig. 4a as a further example of web processing tools which can be provided in the device. Two pairs of guide rails 39, 41, the front one identified by 41, the rear by 39, are maintained between plates of the frame 04. Only the upper guide rail of each pair of guide rails 39, 41 can be seen in the drawing figure, since it covers the rail located parallel with and underneath it. A sliding block 42, 43 is provided at each of the ends of the turning bar 37, wherein the sliding block 42 is slidingly arranged on the visible upper guide rail 39 of the rear guide rail pair, and the sliding block 43 on the visible upper guide rail 41 of the front guide rail pair. Correspondingly, two sliding blocks 44, 46 are provided at the ends of the turning bar 38, wherein the sliding block 44 is slidingly arranged on the not visible lower guide rail 39 of the rear guide rail pair, and the sliding block 46 on the not visible lower guide rail 41 of the front guide rail pair.

A reversing roller 47 is rotatably arranged in the frame 04 between the guide rail pairs 39 and 41 and transversely in respect to them.

A paper web 51, which enters perpendicularly in respect to the guide rail pairs 39 and 41, runs around the oblique turning bar 37 and thereby changes its travel direction by 90°. It loops around the reversing roller 47 and runs from there back again and over the obliquely placed turning bar 38, which is crossed by the turning bar 37, wherein its running direction is again changed by 90°, so that after leaving the turning bar deck it has regained its original running direction, but has been offset by exactly one paper web width and turned.

A pair of threaded spindles 48, which is parallel with the guide rails 39, 41, of which a lower threaded spindle 48 is hidden by the upper threaded spindle 48 in the drawing figure, is rotatably seated in the frame 04. A drive mechanism 49, for example an electric motor 49, acts on an end section of each spindle 48.

If the described arrangement is to be employed for a paper web 52 of lesser width, as shown in Fig. 4b, the distance between the turning bars 37 and 38 for one has to be changed, so that an offset of exactly one web width is achieved. To this end the control unit 10 (or the system S)(not represented in the drawing figure) controls an oppositely directed movement of the motors 49, and therefore of the turning bars 37, 38. It is otherwise possible, in particular if more than two partial webs are to be processed, to require a displacement of the turning bars 37, 38 in the

same direction in order to assure that the partial webs do not come too close to the ends of the turning bars 37, 38. For this purpose the control unit 10 (or the system S) controls each of the motors to run in the same direction.

The just described turning bar deck is represented in Fig. 5a following rebuilding. In this embodiment the turning bars 37 and 38 are slidingly arranged parallel in respect to each other with the sliding blocks 42, 43, 44, 46 on the guide rails of the guide rail pairs 39 and 31.

A paper web 53 to be offset enters the turning bar deck perpendicularly in respect to the guide rail pairs 39 and 41, successively loops around the turning bar 37 and the turning bar 38 and leaves the turning bar deck, laterally offset by one paper web width, without having been turned.

The same as in the case of Figs. 4a, 4b, for matching the turning bar deck to a paper web 54 (Fig. 5b), which is of a lesser width than the web 53, the control unit 10 (or the system S) on the one hand moves the turning bars 37, 38 towards each other, so that the distance between the turning bars is matched to the changed web width and, if necessary, it displaces both turning bars 37, 38 in the same direction, so that the web 54 meets the center of the turning bars to a sufficient degree.

Fig. 6 shows an advantageous embodiment of the turning bar arrangement in accordance with Fig. 4 wherein, however, the arrangement respectively has only one support 39, 41 for the two turning bars 37, 38. The sliding blocks 43, 46 slide on the same support 39, 41 and are driven by means of a common threaded spindle 48, which has two oppositely turning threads for each one of the sliding blocks. The spindle is

driven by the motor 49, wherein the sliding blocks 43, 46 move in opposite directions in the course of the rotation of the threaded spindle.

Fig. 7 also shows an advantageous embodiment of the arrangement in accordance with Fig. 5, wherein here, as in Fig. 6, a common threaded spindle 48 with opposite-turning threads for the sliding blocks 43, 46 is provided. The sliding blocks 43, 46 also run on the same support 41. Driving the threaded spindle 48 by the common motor 49 causes a movement in opposite directions of the two turning bars 37, 38 with their sliding blocks 43, 46.

A turning bar arrangement of a printing press (Fig. 9) has at least one turning bar deck with two turning bars 37, 38 assigned to each other, by means of which a partial web 51 to 54 can be brought into a different alignment and/or can be tipped. It contains a pair of turning bars 37, 38. In an advantageous embodiment not represented here, two turning bar decks, i.e. two pairs of turning bars 37, 38, are provided for offsetting, or for tipping, two partial webs 51 to 54. As represented, the turning bars 37, 38 of one pair can be arranged either parallel in relation to each other and inclined by 45° in respect to the incoming web (offset), or they are arranged perpendicularly in respect to each other and inclined by 45° or 135° in respect to the incoming web (tipping and, if desired, offset).

In advantageous embodiments all turning bars 37, 38 are designed to be pivotable or able to be tipped by 90° in respect to the level of the respective incoming web. In a variation of Figs. 4 and 5, a cantilevered seating of the turning bars 37, 38, i.e. with a fixed and a free end, is

also possible. In this case the supports 39 are omitted. In further development, a means, not represented, is assigned to each of the turning bars 37, 38, which detects the actual position of the turning bars 37, 38 - tilted toward the left or the right - and reports it to the printing press control, or the operating console of the printing press, or the system S. These can be, for example, initiators, which are activated or deactivated mechanically (switches) or electromagnetically (induction, light barrier) as soon as the turning bar 37, 38 is in one of the intended positions. The printing press operator, or a program, can then check whether the turning bars 37, 38 are in the position required for the planned production run. An error signal can be issued through the system S if the position of the turning bar 37, 38 does not agree with the intended production (or web track).

As shown above, in a preferred embodiment every turning bar 37, 38 as a whole is arranged in the superstructure 67 to be movable in a direction transversely in respect to the incoming web. By means of this the turning bar 37, 38 can be positioned by means of the drive mechanism 49 so that it is matched to a product, or a web path, or a web width.

In an advantageous manner it is provided for presetting the printing press that the drive mechanisms 49 of the turning bars 37, 38 are in a signal connection with the system S. On the basis of the production data (for example intended web path, resultant theoretical cutting line, and/or width of the web or partial web), the actual position of the turning bar 37, 38 is compared with a position which has been or can be preset for this production run and, as required, an

appropriate movement is initiated via actuating commands to the drive mechanisms 49 involved. Such presetting values can be stored in tables for the different production runs, or a calculation takes place in the system S on the basis of the use from the web widths and the lateral offset to be obtained.

In a further development of the superstructure 67 a drive mechanism, not represented, for pivoting is assigned to the pivotable turning bars 37, 38 which, for example the same as explained in connection with the drive mechanisms 49, is preset by the above mentioned system S in accordance with the planned production and/or web guidance. Advantageously such a drive mechanism is for example embodied as a cylinder, which can be charged with a pressure medium, which is engaged on the one side with the frame, and on the other with the turning bar 37, 38 outside of its pivot point.

Fig. 8 shows a schematic lateral view of the web processing tool embodied as a former 06, 07. In an advantageous embodiment the former 06, 07 is movable in a direction (at least a component), which is perpendicular in respect to the spine fold of the continuous web leaving the former 06, 07, and/or substantially parallel in relation to an axis of rotation of a cylinder (transverse cutting cylinder, folding blade cylinder and/or folding jaw cylinder) of a downstream located folding apparatus 68 (see Fig. 9). In this way it is possible to set the correct entry into the cylinders of the folding apparatus 68 for different widths of a web or a continuous web and/or positions.

For presetting the printing press it has been provided in an advantageous embodiment that a drive mechanism, not

represented, for driving the described movement of the former 06, 07 is in a signal connection with a control 10, or advantageously with the system S. The actual position of the former 06, 07 is compared by means of production data (for example the width of the web or partial web) with a position which is or can be preset for this production and, if required, an appropriate movement is initiated by means of actuating commands to the drive mechanism involved. The former 06, 07 (or the former tip) must be appropriately positioned, based on the width of the web, partial web or continuous web. For example, the former 06, 07 is positioned in such a way that for each width the folded continuous web reaches the folding apparatus 68, or its folding devices, in a suitable manner - for example centered on the shell face of the following cylinder -. Presetting values can be stored in the form of tables for the various production runs, or a calculation takes place in the system on the basis of the web paths resulting from the web widths and the lateral offset.

The above mentioned web processing tools are, individually or in groups, a component of a machine which works on a web and/or processes a web, for example a printing press (Fig. 9), in particular a web-fed rotary printing press for imprinting one or several webs B. For example, the latter has several units 61, 62, 63, 64, 65, 66, 67, 68, 69 for supplying, for imprinting and for further processing. The web B to be imprinted, in particular a paper web B, is unwound by means of a roll unwinding device 61, for example, before it is fed to one or several printing units 63 via a draw-in device 62. Further printing units 63 can be provided in addition to the printing units 63 normally provided for

multi-color printing (for example four units for multi-color printing), which then can, for example, be employed alternatingly by one or several of the remaining printing units 63 for flying printing forme change. The printing units 63 can also be partially embodied, vertically above each other, as bridge printing units 63 or as (nine or ten cylinder) satellite printing units.

In one embodiment a varnishing unit 64 can be provided in the web path.

Following imprinting and, if performed varnishing, the web B for example runs through a dryer 65 and, if needed, is cooled again in a cooling unit 66, if drying was performed thermally. Downstream of the dryer 65 at least one further conditioning unit, not represented in Fig. 9, such as a coating device and/or a re-wetting device, for example, can be provided in or following the cooling unit 66. Following cooling and/or conditioning, the web B can be conducted via a superstructure 67 to a folding apparatus 68. For example, the superstructure 67 has a silicon unit, not represented in Fig. 1, the longitudinal cutting arrangement 71, and a turning device 72, or turning bar unit 72, having at least one turning bar deck, as well as a former unit with the former(s) 06, 07. The said silicon unit can also be arranged upstream of the superstructure 67, for example in the area of the cooling unit 66. Furthermore, the superstructure 67 can have a perforating unit, not represented in Fig. 9, a gluing unit, a numbering unit and/or a plow folding device. After passing through the superstructure 67, the web B, or partial webs B1, B2, are conducted into the folding apparatus 68.

In an advantageous embodiment the printing press additionally has a separate transverse cutting device 69, for example a so-called planographic delivery device 69, in which a web B which, for example, had not been conducted through the folding apparatus 68, is cut into format sheets and, if required, stacked or delivered.

Preferably, the system S for presetting is assigned to the printing press, for example as an additional program in a printing press control device and/or a planning system, which is in a logical signal connection with one or several of the above mentioned processing tools, or units 61, 62, 63, 64, 65, 66, 67, 68, 69, in particular the units 61, 63, 67.

In an advantageous further development the elements of the roll changer 61 also fall under the above mentioned processing tools. For example, it is also advantageous in case of production changes by means of one or several of the above mentioned web processing tools, to simultaneously perform a lateral displacement of the roll arms for matching the new width and/or position of the web. The displacement of the roll is useful, for example, if a partial web is intended to be moved through the printing press in a different alignment.

It is also advantageous if simultaneously a lateral adjustment of cutting register and/or color register measurement members, for example sensors, and/or a web edge regulation device 57, are matched to the new production run in the axial direction, and/or an adjustment of the contact pressure rollers against the traction roller underneath the former takes place.

In the area of the folding apparatus, an adjustment of the paddle wheel in the outlet, an adjustment of the gluing nozzles of a possibly provided gluing unit, an adjustment of the second longitudinal fold, and/or an adjustment of the perforating cutter for longitudinal perforation, can take place simultaneously, for example for different adjustments.

In the above context, in the wider sense the term web processing tools is also understood to include sensing and actuating devices, which have an effect on the detection and the influencing of the running of a web, or partial web, or continuous web.

When presetting the printing press, for example at the start of a production run, the system S receives data relevant to the planned production run from a product planning system, a print preparation stage, the printing press operator himself, and/or an existing imposition pattern for presetting. For example, the imposition pattern contains the paths of the webs or partial webs intended for the planned production run, as well as the provision of the forme cylinders with the print pages, as well as the ink colors of the different printing groups. Information regarding the web width and/or the intended lateral position of the web can then be entered by the printing press operator, or can be obtained from a machine control device, the roll changer 71 itself, a logistics system, or from a product planning system.

For positioning the longitudinal cutting arrangement 71 and/or the roll changer 61, the information regarding the planned web width and/or the web position, for example, is used, for positioning the former 06, 07 the partial web

width. The information regarding the intended paths of the web, or partial webs, is processed for positioning the turning bars 37, 38 and, if required, a linear registration device 58 assigned to the partial web in the superstructure 67. In further development it is possible to perform the presetting of colorimeters in the printing groups, for example, by using data from the print preparation and/or the imposition pattern (color densities, deployment, etc.).

In an advantageous first variation of the simplest embodiment of the printing press, at least the longitudinal cutting arrangement 71 in regard to the web to be processed is preset by the system S. In this case the roll changer 61 can, if desired without "external" presetting, always be regulated to the center by means of its own inner control circuit. In a further development, in this process the former 06, 07, or the former unit 73, are also positioned (laterally and/or in the paper running direction) by the system S.

In a second variation of the printing press, at least the positioning (laterally and/or in the paper running direction) of the former 06, 07, or the former unit 73, is preset by the system S or the control device 10. It is then possible to position, together with the former 06, 07, a cutter 05 and/or a downstream arranged driven shaft 30 and to connect them with the former. In this case the roll changer can, again if desired without "external" presetting, always be regulated to the center by means of its own inner control circuit.

In a well-appointed embodiment, presetting for positioning the former 08, 07 and of the turning bar unit 72,

as well as possibly also of the roll changer 61, is performed by the system S.

In an embodiment alternatively to this, presetting of the longitudinal cutting arrangement 71 (i.e. at least one cutter 28, 32), and of the turning bar unit 72, as well as possibly also of the roll changer 61, is performed by the system S. In a greatly automated embodiment the former 06, 07 is positioned in addition.

In addition to the above mentioned three enlargement stages, presetting of the colorimeters and/or of the stripper elements can also advantageously take place by means of the system S.

Basically, depending on the need and degree of automation, a selection of units or partial units which are to be preset and which differs from what was mentioned above, can be provided. Thus, for example, presetting can only be directed to setting the colorimeters and the longitudinal cutting arrangement 71, while in another embodiment all units or partial units provided for web guidance and for cutting, in particular those of the superstructure 67, can be intended for presetting.

In addition to the above mentioned enlargement stages and their variations it is advantageously possible to perform presetting of cutting register and/or color registration measurement members 56, for example sensors, and/or a web edge regulation device 57, in the axial direction in view of a new production run, and/or an adjustment of the contact pressure roller 35 (or rollers) against the traction roller 30 in response to an expected thickness of the continuous web underneath the former 06, 07 takes place.

The drive mechanisms 11, 23, 34, 49 of the mentioned processing tools, at least those of the processing tools intended for presetting, are preferably designed to be remote-controlled, or are remote-controlled by the system S or the control device 10. In contrast to actuating members which are operated manually or only at the position, presetting is possible in this way in one or several of the previously mentioned embodiments and variations in an easy and rapid manner via the system S or the control console.

The system S can be embodied as a control unit S, which includes a user interface for input and/or an interface for reading-in (from the printing press control device, a production system and/or a print preparation stage) of at least a width and/or a web path of a web to be processed, computer means for determining a desired position of the units, partial units or processing tools to be preset, such as the roll changer 61, the longitudinal cutting arrangement 71, the turning bar 37, 38, a linear registration device 58 assigned to the partial web, and/or the formers 06, 07, on the basis of the web width, as well as drivers for triggering the associated actuating members for setting the respectively determined desired position.

List of Reference Symbols

01	Web, web of material, partial paper web
02	Web, web of material, partial paper web
03	Roller, cylinder
04	Frame
05	Web processing tool, interval cutter, skip slitter
06	Web processing tool, former
07	Web processing tool, former
08	Threaded spindle
09	Sliding block
10	Control unit
11	Drive mechanism, electric motor
12	Web, web of material, partial paper web
13	Web, web of material, partial paper web
14	Roller
15	Frame, stand
16	Web processing tool, roller, interceptor rollers, traction rollers
17	Guide rail
18	Sliding block
19	Sliding block
20	Groove
21	Sliding block
22	Spindle, threaded spindle
23	Drive mechanism, electric motor
24	Guide rail
25	Bearing

26	Web, web of material, paper web
27	Carriage
28	Web processing tool, cutter
29	Counter-pressure roller
30	Roller, traction roller, transfer roller, driven
31	Counter-pressure roller
32	Web processing tool, cutter
33	Threaded spindle
34	Drive mechanism, electric motor
35	Roller, contact pressure roller
36	Web, web of material, paper web
37	Web processing tool, turning bar
38	Web processing tool, turning bar
39	Guide rail pair, guide rail, support
40	-
41	Guide rail pair, guide rail, support
42	Sliding block
43	Sliding block
44	Sliding block
45	-
46	Sliding block
47	Reversing roller
48	Threaded spindle pair, threaded spindle
49	Electric motor
50	-
51	Web, web of material, paper web
52	Web, web of material, paper web
53	Web, web of material, paper web
54	Web, web of material, paper web

55	-
56	Color registration measuring member
57	Web edge regulating device
58	Linear registration device
59	-
60	-
61	Roll changer
62	Draw-in device
63	Printing unit
64	Varnishing unit
65	Dryer
66	Cooling unit
67	Superstructure
68	Folding apparatus
69	Planographic delivery device
70	-
71	Longitudinal cutting arrangement
72	Turning bar unit
73	Former unit
M	Center line
P	Product planning system, machine control, imposition pattern, control console
S	System, control unit